

# Non Invasive Treatment of SUI with CO2 Laser

## Author:

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## Introduction:

Stress Urinary Incontinence (SUI) is defined as the involuntary leakage of urine. This is a very common situation among young women either with history of multiple vaginal deliveries or with one, but destructive delivery. SUI is considered one of the most distressing problems for young females which can have impact on quality of life. SUI is caused by loss of support of the urethra which is usually a consequence of damage to pelvic support structure, also histological changes in the structure of the vaginal wall, has an important effect on the supporting system under the urethra and especially under the medial urethra. Usually these patients report leakage of small amount of urine with activities which increase abdominal pressure such as coughing, sneezing and lifting heavy weights.

Using non ablative CO2 Laser energy under the medial urethra and repeating the treatment for three times every month shows an important and reportable improvement of the symptoms.

## Keywords:

Stress Urinary Incontinence, CO2 Laser application, FemiLift, collagen remodeling.

## Case Presentation:

Our patient is 50 Years old G1 P1, who gave her vaginal delivery 16 years ago. The patient is complaining for small amount of urine leakage since 6 years. She reports leakage symptoms during winter time, especially with coughing and sneezing. She prescribes that she changes 2 to 3 cotton pads a day when her coughing is getting worst. Patient reports one to two drops every time she sneezes or coughs. Patient reports that she used to do Kegel exercises for the last 8 months without any improvement. She decided to visit us because this situation starts to get worst with a bad impact in her personal life as well as on her self-confidence.

The patient advised to undergo some tests and exams and this would be followed by the discussion and the options of the treatment.

The patient did the next tests and exams:

- Uroanalysis: To confirm non urine infections. Results were negative
- Normal Ultrasound: To image the uterus and verify non myomas or any mass in the area. Results were negative
- Post voidal Ultrasound: To measure any residual urine inside the bladder. Results shows non-significant quantity of urine in the bladder
- Cough test: Done with patient standing and pressure on her knees. We asked her to cough after drinking 1 liter of water. Results shows, loss of 2 drops of urine every time the patient was coughing
- Q Test: To find out if the patient suffering from hyper mobility of the urethra. Results shows only 20% of the tip elevation and this is non-indictable to hyper mobility of the urethra

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**Figure 1: Colposcopy Picture of the upper vaginal wall before the 1<sup>st</sup> application with Non Ablative CO2 Laser, "FemiLift"**

The patient informed for the options that she has. She advised to undergo Noninvasive CO2 Laser method "**FemiLift**" as the most safe for her case considering the zero down time, the zero pain and the most important is that she is candidate to have the same percentage of improvement or complete treatment as with the surgical method.

**Method:**

As explained before, the anatomical defect in this case is the loss of support from complex of tissues under the med urethra. In our current case, we will target the under med urethral space with non-ablative CO2 Laser beam. The power of the application needs to be enough in order to stimulate the collagen and elastic fibers in the sup-mucosal space. With the non-Ablative CO2 "**FemiLift**" we have the advantage of non-sharing the tissues comparing to fractional CO2 scanners but also to work deep enough for better stimulation comparing to Erbium Lasers.

Before doing the treatment we follow a certain protocol. We ask the patient to do the next tests:

- Pap smear. Negative for any cervical or vaginal malignancy, HPV, HSV
- Pregnancy test: Negative

The patient agreed to have 3 consequence sessions, one session every 4 weeks.

During the 1<sup>st</sup> session, we did the application under the med urethra in three positions:

- 1cm distal of the med urethra level. Application with 110mj/ppl with high laser mode and 0,5 Hz
- Directly under the med urethra. Application with 110mj/ppl with high laser mode and 0,5 Hz
- 1cm before the med urethral level. Application with 110mj/ppl with high laser mode and 0,5 Hz

This protocol will be repeated exactly with the same settings for three passes on the same positions during the same session.

The treatment has been done without any kind of anesthesia. The duration of the application was 20 minutes to be completed. The patient advised to avoid sexual intercourse for 3 days.

- The same protocol has been repeated for another two sessions. 4 and 8 weeks after the 1<sup>st</sup> session.

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**Figure 2: Colposcopy Picture of the upper vaginal wall after the 1st application with Non Ablative CO2 Laser “FemiLift”**

**Discussion:**

- In our case, the treatment of SUI was with the usage of Non ablative CO2 Laser technology “**Femilift**”. After several tests and special exams, we decided that our patient was a candidate for this treatment. The goal of using this laser technology is to achieve new collagen remodeling and elastic fibers recreation in the tissues under the med urethra. The penetration of the laser is safe and it doesn’t exceed 500 microns. The fact of using Non ablative CO2 Laser “**FemiLift**” in this area gives us the advantage of affecting the tissue with thermal damage (48-72 hours) after the application. This process will create edema in the surrounding tissues; will release chemical mediators and shrinkage of the collagen will be obtained. On the main time, the changes in the cellular level are rapid and transient, and characterized by the production of a small family of proteins termed as Heat Shock Proteins (HSP) which can be defined as the temporary changes in cellular metabolism. HSP 70, which is over expressed following laser irradiation, could play a role transforming growth factor TGF-beta. TGF-beta is known to be a key element in the inflammatory response and fibrogenic response. In this process, the fibroblasts are the key cells since they produce collagen and extracellular matrix. During the proliferation phase (30 days) after the application, fibroblastic recruiting will take place with the creation of new dermal molecular and new collagen fibers to replace the old one. The final phase will be the remodeling phase with placement of mature collagen fibers and with the increase of collagen fiber strain, finally will have new elastic fibers.

Final scope with this treatment is to achieve enough collagen remodeling and fibroblasts recreation and finally to increase the thickness of the vaginal wall in this

area in order to increase the support under the level of the med urethra. This would give the patient continence and results would be lasting approximately for 2 years. A memory session one year after the last application, is recommended in order to keep the collagen in continuous recreation.

**Conclusion:**

Concluding the previous case, performing the procedure of Stress Urinary Incontinence SUI with Non ablative CO2 Laser “FemiLift” in three sessions, we achieved complete cure of the symptoms already after the 2<sup>nd</sup> session. Patient reported no leakage anymore with coughing and sneezing. Cotton pads tests for 2 weeks was negative. Office coughing test was negative. Patient advised to comeback after one year for re assessment and a memory session.

Level of Patient Satisfaction:

Low Satisfaction to High Satisfaction

	1	2	3	4	5 (high)
Pain during procedure					•
Pain after procedure				•	
Satisfactory after 1 <sup>st</sup> session		•			
Satisfactory after 2 <sup>nd</sup> session					•
Satisfactory after 3d session					•

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**Figure 3: Colposcopy Picture of the vaginal wall one month after the application of 2nd session of Non Ablative CO2 Laser “FemiLift”**

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**Figure 4: Colposcopy Picture of the vaginal wall one month after the application of 3d session of Non Ablative CO2 Laser “FemiLift”**

**Consent:**

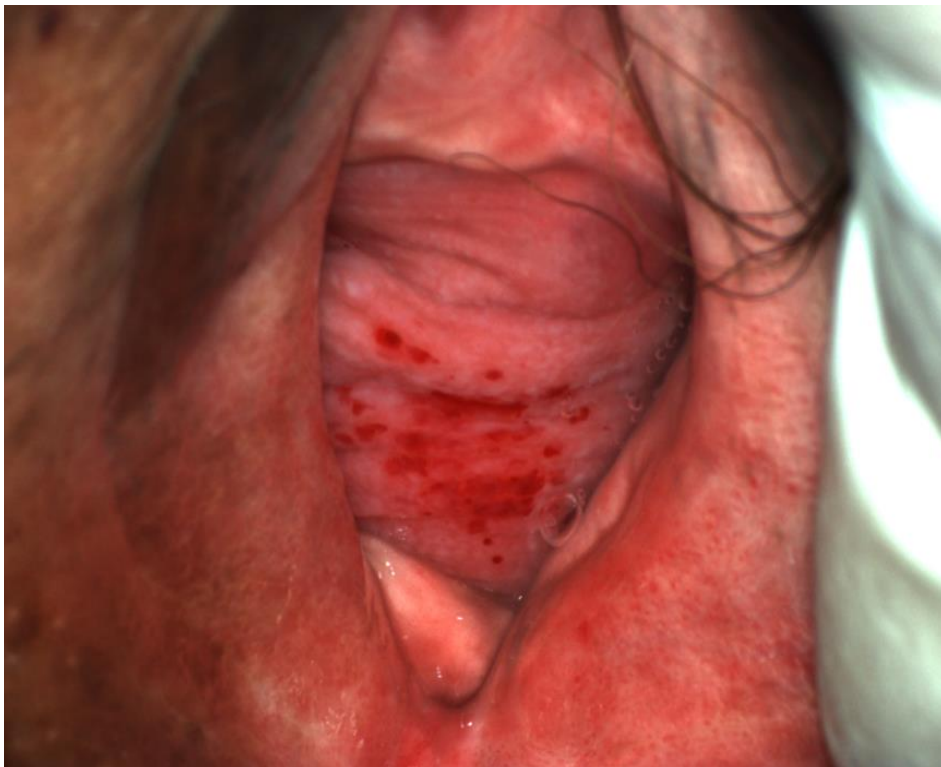
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of this consent is available for reviewed in case if it needed.

**Competing interests:**

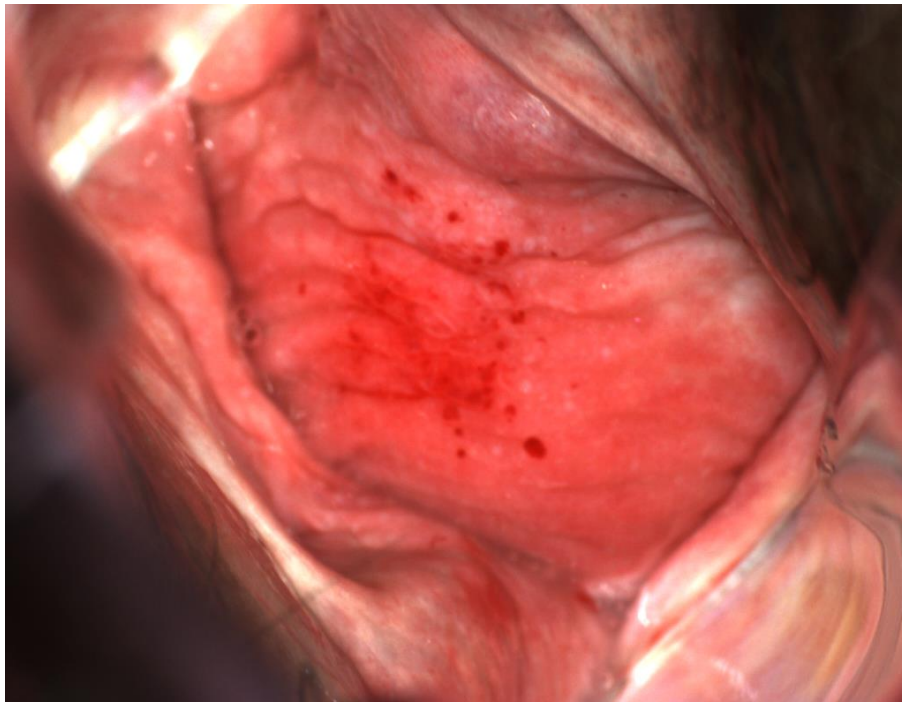
The author declares that he has no competing interests.



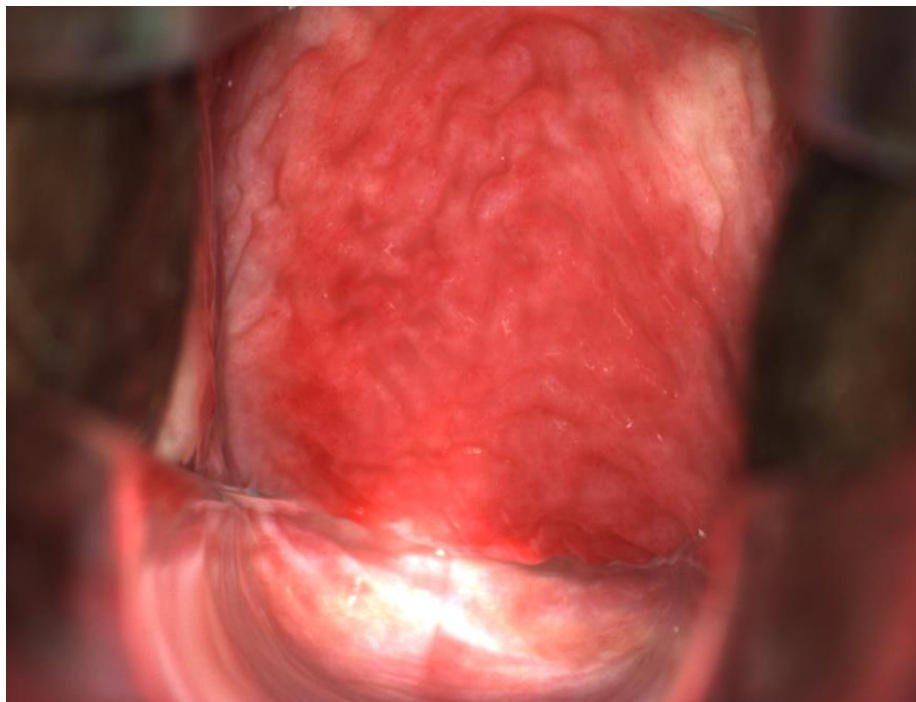
**1<sup>st</sup> Figure : Before the Application**



**2<sup>nd</sup> Figure: Immediately after 1at Application**



**3d Figure: Immediately after 2<sup>nd</sup> Application**



**4<sup>th</sup> Figure: 1 month after 3d Application**

**Literature list:**

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